



# ZODIAC



## DuoClear Owners Manual

*Dear Customer,*

Congratulations on purchasing DuoClear Complete Sanitation System. DuoClear will help you and your family to benefit from greater enjoyment of your pool. There are two major advantages in owning a DuoClear system. First you will find that the pool will be easier to maintain, secondly you will notice the clarity and feel the softness of the water.

Please take the time to read through your DuoClear Owner's Manual. It is set out in such a way that you can see the simple steps to keep your pool in pristine condition. This owner's manual will provide you with useful information on how to operate the DuoClear system most efficiently and help you to understand more about the maintenance of your pool. Your local pool shop can also be helpful in a more detailed explanation in the care of your pool and assist you with any questions or problems. Don't forget that your DuoClear System is backed by a comprehensive warranty. The DuoClear warranty is an expression of the confidence that Zodiac Group Australia Pty Ltd has in its products, and is your assurance of prompt and expert after-sales service by professional technicians. Please complete all details on the warranty card and return it to us. Having this recorded in our computer system will help us to quickly identify the model and its specifications to assist in any questions or problems you may encounter.

If you require any additional information talk to your local pool shop, or telephone

Zodiac Group Australia Pty Ltd: 1800 688 552.

Due to constant developments and improvements, specifications may change without notice.

## SAFETY INSTRUCTIONS

To avoid injury and correct operation of DuoClear, installation should always be carried out by a properly qualified technician, or a Zodiac trained technician. Qualified personnel should **always** install electrical equipment. When installing and using any electrical equipment, basic safety precautions must always be followed;

- 1) READ AND FOLLOW ALL INSTRUCTIONS
- 2) Do not bury electrical cord. Locate electrical cord to minimise contact from lawn mowers, edge trimmers or other sharp equipment.
- 3) WARNING – To reduce the risk of electrical shock have any damaged cord replaced immediately.

4) **IF the supply cord is damaged it must be replaced by the manufacturer or its service agent or a similarly qualified person to avoid a hazard.**

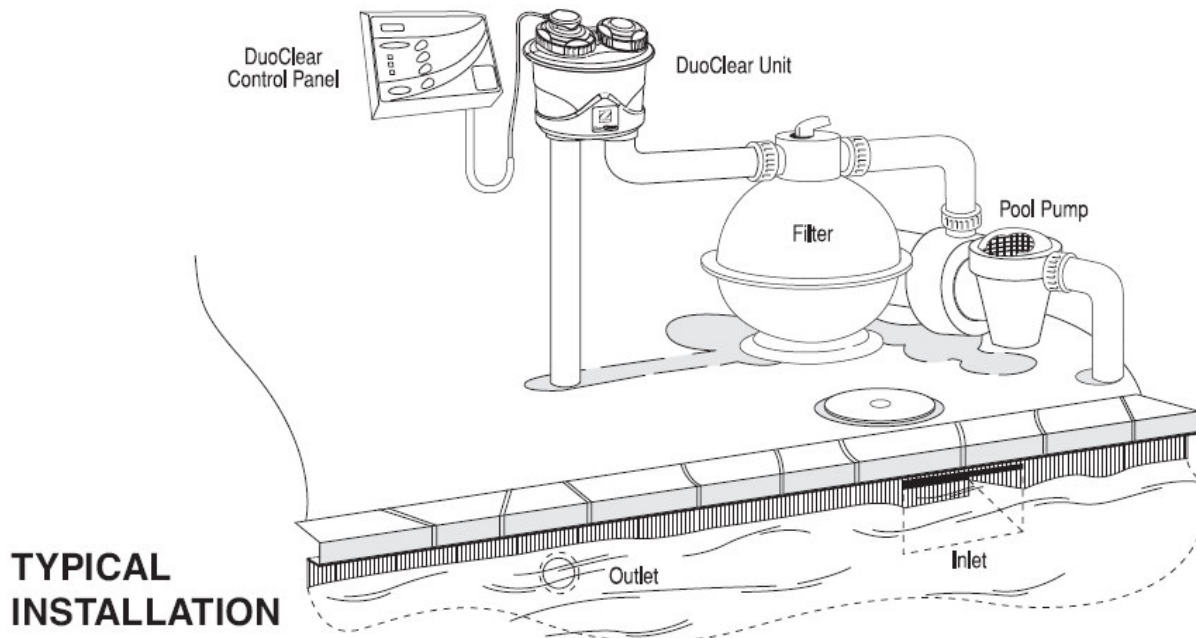
5) **DO NOT ALLOW CHILDREN TO TOUCH OR COME WITHIN 2 METERS OF ANY POOL EQUIPMENT & CHEMICALS.**

## **Keep these instructions in a handy location**

To the Pool Owner: KEEP THIS MANUAL FOR DUOCLEAR INSTRUCTIONS

To the Builder: LEAVE THIS MANUAL WITH POOL OWNER

## **THE DUOCLEAR SYSTEM**



When the pump and filtration system is running, water that has passed through the pool filter is then passed through the Zodiac DuoClear system. The system consists of two processes:

1. **Nature2:** The media mix contained in the Nature2 cartridges is coated with silver and copper. A trace of copper inhibits algae growth. A trace of silver is released by water flow to assist and maintain the pool crystal clear and helps maintain the water balance.

2. **Salt Water Chlorinator:** After the water has passed through the Nature2 cartridge it flows through the self cleaning chlorinator cell, which constantly injects a small amount of chlorine into the pool water to provide the primary function of a bactericide and algacide in the pool water. When using the DuoClear system, you need to add Chlorine as per the Australian Standard AS 3633.1989 for your type of pool. To ensure your system works at maximum efficiency, regularly maintain the chemistry of your pool.

### **Preferred Water Chemistry Readings**

Ideal Salt concentration 4,000 ppm @ 27°C

pH 7.2 to 7.8

Chlorine stabilizer (Cyanuric acid) 30 to 50 ppm

Total alkalinity 80 to 150 ppm

Total hardness 200 to 400 ppm

Free chlorine 1 ppm or as table on page 16

Maximum Salt Level 13,000 ppm

## DUOCLEAR START UP PROCESS

**Before starting up the Zodiac DuoClear system you must add the required amount of salt for your sized pool. See page: When and How to add it". The salt should be completely dissolved, and mixed with your pool water.**

1. Install the complete Zodiac DuoClear system.
2. Super Chlorinate the pool, by adding 500g of dry chlorine or 4 litres of liquid chlorine per 40,000 litres of pool water.
3. Make sure your Alkalinity and pH are within the pool water standards (See Preferred Chemistry Readings above). Run your DuoClear system for 48 hours with one yellow and one green chlorine output light illuminated.
4. After 48 hours set the chlorine level to maximum (by pressing the "**Chlorine Output**" button (8) until the one yellow and five green lights are showing) and continue running the system to maintain the chlorine level at about 1-2 ppm for 6-8 hours a day for a further 4 days.

**CAUTION:** This period should be extended in periods of very hot weather or heavy rain. Press the "**Nature2 Reset**" button (11) to activate the cartridge timer, which will let you know when to replace the Nature2 cartridge. (A high chlorine level is required to initiate the release of the silver and copper from the Nature2 cartridge).

5. Once cartridge activation period is completed reduce chlorine output to maintain the chlorine level at 1ppm. This is achieved by pressing the "**Chlorine Output**" button (8) so that the yellow light and two green lights are showing. Remember one yellow light is low output and increasing number of green lights, means increased chlorine output.

## HOW YOUR DUOCLEAR WORKS

Common salt (sodium chloride) is made up of two elements, sodium and chloride. When your Zodiac DuoClear is installed, the salt dissolved in the pool water makes it slightly salty. As part of the daily filtration cycle, the pool water is passed through the DuoClear system, the Nature2 cartridge releases copper and silver consistently into the water during the life of the cartridge. The electrodes in the salt water chlorination cell produce chlorine which is injected into the water flowing through the DuoClear vessel to the pool. Your DuoClear also produces small amounts of ozone, at the electrode cell as a by-product. In simple, non-technical terms, chlorine controls/kills the bacteria and algae and in doing so, reverts back to dissolved salt, copper inhibits algae growth and silver assists and maintains pool clarity and helps maintain water balance. Everyday, when your DuoClear and the filtration system are switched on, dust and debris are trapped by the filter, and your DuoClear system sanitises the water, to make it safe and sparkling clean.

### IMPORTANT

To ensure your DuoClear system works at maximum efficiency, regularly check and maintain the chemistry of your pool. (See Preferred Water Chemistry details page 3).

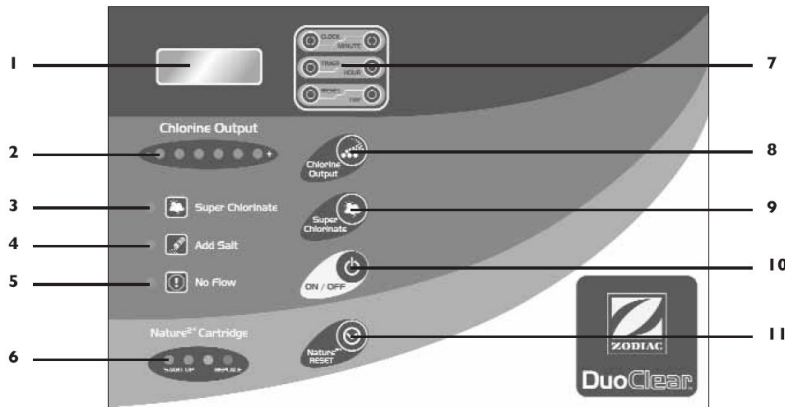
### DUOCLEAR OPERATION

The system has a set of four lights which indicate the life of the Nature2 cartridge. (Nature2 Cartridge Indicator lights page 6). The "Start up" lights are 2 green and 1 yellow. Over six months the 2 green lights and yellow light gradually go out, and then a red light begins to flash. When this red light flashes you must replace the Nature2 cartridge. If the cartridge is not replaced quickly the sanitising and purifying effects of the DuoClear system will become less efficient. In addition, failure to replace the cartridge regularly every 6 months will void 'The Lifetime Warranty' on the electrodes.

Chlorine production of the DuoClear system is controlled by the number of hours the DuoClear and filtration system is ON, as well as the setting of the chlorine output control.

The DuoClear and filtration system should be operated automatically through the DuoClear timeswitch.

## CONTROL PANEL FUNCTION FEATURES



**Clock and Timer Setting.** (7) Use to automatically set the operating Times/Days of the total pool system including the Zodiac DuoClear system.

The “**Chlorine Output**” (8) controls the amount of chlorine generated by the electrode. It has 6 indicator lights, (See control panel illustration above) 1 yellow (minimum output) and 5 green indicator lights (2). Maximum chlorine output is achieved when all lights are on.

The “**Super Chlorinate**” (9) function increases the chlorine output for the next 24 hours of running time. This is used when the pool needs extra sanitation after heavy rain, hot weather or heavy bather loads. A green indicator light (3) will be on when this function is operating.

“**Add Salt**” (4) indicator – yellow light

“**No Flow**” (5) indicator – red light

“**ON / OFF Button**” (10) Overrides any automatic internal timeswitch setting and switches the DuoClear and filtration system ON and OFF. Helpful when checking and/or altering the chlorine output settings and other maintenance tasks. Operation of the **ON/OFF** button will not change the timeswitch settings. In fact the DuoClear is so smart, that if you forget to switch back to normal operation, it will switch itself back to automatic for you.

### CONTROL PANEL FUNCTION FEATURES

“**Nature2 Reset Button**” (11) Only used at start up of your new system, or whenever the Nature2 cartridge is replaced.

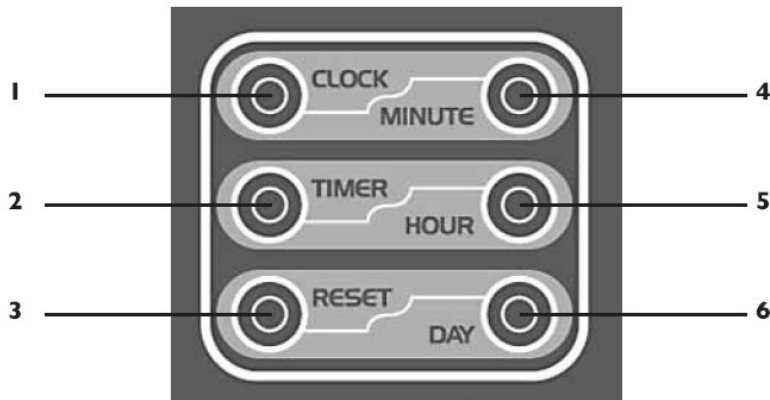
DuoClear is designed to require minimum operator maintenance, once it is set. The reverse polarity technology minimises scaling of your saltwater cell.

### Backup Battery.

Your DuoClear system is fitted with a long life rechargeable battery. If the power is removed, it will retain the timeswitch settings, Output power settings, Super Chlorinate settings, and the Nature2 indicator settings.

# USING THE CONTROL PANEL OPERATING FUNCTIONS

## AUTOMATIC OPERATION



(Illustration of Timer and Clock with numbered controls)

### Timeswitch (7)

The Zodiac Duoclear system should be OFF before using or altering the timeswitch settings. Initially the timeswitch display may be blank. Once mains power is applied to the internal backup battery, it will only take about 5-10 minutes to be charged for the display to turn on.

All the timeswitch settings can be cancelled by using the "Clock -Reset"(3) button. This will leave the clock display flashing. Pressing the "Clock"(1) button will stop this display flashing, the following procedure is used to set the clock:

### Setting the Clock.

1. Push and HOLD down the "Clock" (1) button.
2. Press the "Min" (4) button to increment the minutes.
3. Press the "Hour" (5) button to increment the hours. Note the hours are displayed in 24 hour format.
4. Press the "Day" (6) button to increment the day.
5. When you have finished setting the clock release the "Clock" (1) button.

## SETTING THE TIMER FOR AUTOMATIC OPERATION

### To Set the ON/OFF times

1. Press the "Timer" (2) button to step through to the timer setting you wish to set. "Time 1 ON" is shown on clock. Press the "Min" (4) button to set the minutes (i.e. 30). Press the "Hour"(5) button to set the hours. (i.e. 7.00)  
Press Timer again "Time 1 OFF" is shown on clock. Press the "Min" (4) button to set the minutes (i.e. 30). Press the "Hour"(5) button to set the hours. (i.e. 11.00).  
Press Timer again "Time 2 ON" is shown in clock. Press the "Min" (4) button to set the minutes (i.e. 30). Press the "Hour"(5) button to set the hours. (i.e. 16.00) Press Timer again "Time 2 OFF" is shown in clock. Press the "Min" (4) (i.e. 30) button to set the minutes. Press the "Hour"(5) button to set the hours. (i.e. 20.00). By repeating this procedure it is possible to have your filtration and the DuoClear system operate up to 6 different times per day. You must set an "OFF" time for each "ON" time.  
It is not essential to use all 6 on/off timer settings, but for more efficient pool sanitation and filtration it is recommended you use at least two periods per day i.e. Two periods of 4-5 hours each in the swimming season and two periods each of 2-3 hours in the off season.

**NOTE:** If the "Day" display is not showing, the times will be the same for every day and you need not continue further. If you wish to set the timer for different times on different days then continue on - for instance at weekends when the pool is used more often.

Press the "Day" (6) button to step through the days.

MO,TU,WE,TH, FR, SA and SU – to set different times on any day of the week.

"MO,TU,WE,TH, FR" – to set the same times from Monday to Friday

"SA, SU" – to set the same times on Saturday and Sunday.

"MO,TU,WE,TH, FR, SA" – to set the same times from Monday to Saturday.

The next press of the "Day" button will turn off the MO, TU, WE, TH, FR, SA, SU display (no day display showing), in this mode the timer operates at the same times on every day. This is the normal setting.

**NOTE:** Pressing the "Clock" (1) button will get you out of timer set mode, or after a few minutes the time switch will automatically revert back to the clock mode.

If you do not wish to use separate settings for individual days, ensure that the ON/OFF settings are clear to avoid unwanted ON/OFF times.

Use of the "ON/OFF" (10) control overrides the timeswitch settings to switch the chlorinator and the connected pump ON or OFF. This function is helpful for checking and altering the chlorine production settings, and other maintenance tasks. The normal timer settings are not changed by this process and will resume at the pre-set time.

### Setting the "Chlorine Output" (2)

Chlorine production is controlled by both the number of hours of ON time set on the time switch above and by controlling the "Chlorine Output" (2) Repeated pushing of the "Chlorine Output" (2) button increases the chlorine production one step at a time and the number of "Chlorine Output" indicator lights showing, until maximum is reached (One yellow and five green lights). An extra push of the "Chlorine Output" button resets the output to minimum - one yellow light.

**NOTE:** This setting does not show the actual chlorine reading in the pool. Use of a test kit is required to confirm the Free Chlorine reading of the pool water. (Or take a water sample to your pool shop for testing).

**Yellow light Flashes.** The yellow (minimum output) light will flash for a few minutes when the electrode cell reverses (Self cleaning function) indicating no output during this time.

### "Super Chlorinate" (3)

The Super Chlorinate (3) function is used to rapidly add chlorine to the pool. When pressed, the timer and chlorine output settings are temporarily overridden and the chlorinator is set to run for approx. 24 hours at increased chlorine production. A green light will indicate this is functioning. (This operation will keep the full filtration process running for 24 hours) To disable this process prior to the 24 hour cycle, press the Super Chlorinate (3) button a second time and the light will go off. Normal timer operation and output settings resume at the conclusion of the pre-set Super Chlorinate period. (See '**Problems you may encounter**' parts B & C pages 22/23 for details regarding when the Super Chlorinate function should be used).

**NOTE:** During **Super Chlorinate** start up the chlorinator may actually switch the cell off for a few minutes as the cell is prepared for the following 24 hours operation. If this happens, the yellow "**Chlorine Output**" (minimum output) indicator light will flash for a while.

### "Add Salt" (4)

The "Add Salt" light (4) will come on at any salt level between 3000ppm and 4000ppm depending on mains voltage and water temperature. This is not a fault but a precaution to ensure the salt level is never too low. (See 'Salt: When And How To Add It').

**NOTE:** Operating the DuoClear system at reduced salt levels may shorten the life of the Electrode.

### **“No Flow” (5)**

The “No Flow” light (5) will come on if there is insufficient water flow in the cell, usually caused by the pump not running. The **“Chlorine Output”** function (2) will also turn off at this time. (See “Problems you may encounter” - section H). The “Chlorine Output” indicator lights (2) will also turn off at this time.

### **“Nature2 Cartridge” Indicator Lights (6)**

A series of 4 lights indicate the progressive life of the Nature2 Cartridge. When the Nature2 Cartridge is first installed and started the **“Reset”** (11) button should be pressed and the **“Nature2 Cartridge”** (6) will display 3 indicator lights - 2 green, 1 yellow. As the timer counts down, the 2 green lights, then the yellow light will progressively go out to bring a red light on and flashing. This indicates the Nature2 cartridge has lost its effectiveness and needs to be replaced. (The Nature2 cartridge has a six months life.)

**All Lights OFF.** If all the lights are OFF it indicates the DuoClear system is turned off. Check if the **“Clock”** indicates ON or OFF, or if the mains power is disconnected. Check the mains.

### **DUOCLEAR MAINTENANCE**

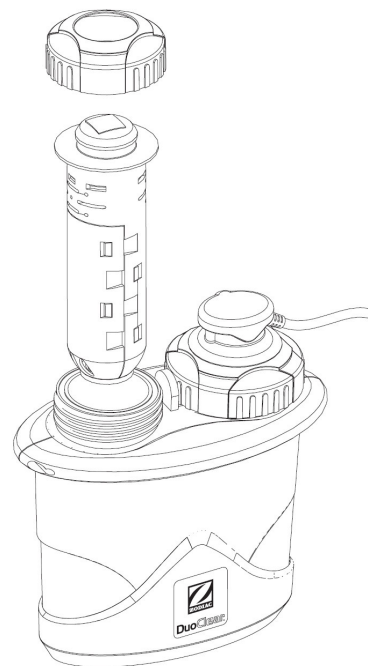
## **Replacing the Nature2 DuoClear Cartridge**

A Nature2 cartridge lasts six months under normal operating conditions and should be replaced as soon as the Nature2 Cartridge life indicator light (6) turns RED and flashes.

#### **To replace the cartridge:**

- a. Shut off your pool’s power system.
- b. Close any valves between the filter and pool to prevent draining the pool.
- c. Unscrew the cartridge retaining cap and remove the cartridge.
- d. Fit the new cartridge and secure it with the cartridge retaining cap.
- e. Press the “Nature2 Reset button (11) on the power pack, so that the three indicator lights (3) (2 green and 1 yellow) are on.
- f. Open any valves that were closed to isolate the Zodiac DuoClear vessel.
- g. Restart your pool’s pump and filtration system. Check for leaks, fix any leaking fittings.
- h. Follow the Nature2 cartridge Start Up procedures described on page 3.

**NOTE: The DuoClear system requires sufficient residual silver and copper in the pool to assist in maintaining the pool water balance and quality. If the DuoClear system is operated without replacing the Nature2 cartridge when indicated by the flashing red indicator light, the pool water quality will deteriorate. Failure to regularly (every 6 months) replace the Nature2 cartridge will also void the lifetime electrode warranty**



## **How to clean or inspect your Electrode cell**

You should regularly check the Electrode to see if any debris has passed through the filtering systems and need removing from the electrode compartment or caught in the Electrode itself. In addition, global experience has shown that on rare occasions in areas with very ‘hard’ water, the self cleaning Electrodes may benefit from occasional manual cleaning.

#### **To carry out both of these recommendations:**

1. Switch off the filter pump and DuoClear, close necessary valves.
2. Unplug the Electrode connector from the DuoClear vessel.
3. Unscrew the Electrode retaining cap and remove the Electrode.
4. Remove any debris in the Electrode compartment or on the Electrodes and then replace it as indicated below.

5. If you can see hard white calcium on the electrode immerse it in a container of Electrode cleaning solution ensuring that the terminals are not immersed in the solution.

You can purchase Electrode cleaning solution from a pool shop, or mix your own in a suitable plastic container by adding one (1) part of Hydrochloric (Muriatic) acid to ten (10) parts water. Allow the cleaning solution to dissolve the calcium deposits for about 10 minutes and remove the Electrode from the solution.

**Note: The use of eye protection is recommended when working with pool chemicals.**

6. Repeat the procedure if necessary. Take care to avoid splashing the Electrode terminals and other equipment with the acidic cleaning solution. Wash down any spills with plenty of fresh water

7. Rinse the Electrode in clean water and refit the electrode to the DuoClear vessel and tighten the Electrode in place with the Electrode retaining ring.

8. Replace the electrical connectors after drying and smearing lightly with silicone grease.

9. Reopen valves and reset switches. Turn the pump and Zodiac DuoClear system on. Confirm chlorine output and settings on the power pack. Timer settings are automatically retained.

10. The Electrode cleaning solution should be disposed down sewerage not storm water pipes. Note that the solution is now near neutral pH and environmentally friendly.

### **Damage caused by insects**

The case of the DuoClear control panel has small vents to allow internal components to remain cool in hot weather. Sometimes small insects may enter the case of the power pack, and this can cause damage to the internal electrical components. To avoid this, spray some insect repellent on surfaces around the power pack.

## **OPERATING HINTS**

### **A. Filtration and chlorination system operating periods.**

The DuoClear system timeswitch automatically switches the filtration and DuoClear system ON and OFF, up to six times a day.

Run your filtration and DuoClear system for at least 6 to 8 hours per day in the swimming season. For best efficiency, operate the system in the cool hours of the evening, and/or the early morning.

During very hot weather it might be necessary to run the system for around 10 hours per day, but in winter, it is only necessary to run the filtration system for around 4 hours per day. Shorter periods will help to maintain the efficiency of the cell electrodes.

### **B. Chlorine output settings.**

Commence operation of the DuoClear system at maximum output. Add salt to the pool if the 'Add Salt' light is showing.

For maintenance of a home salt water pool of about 50,000 litres, the addition of one 25Kg bag of salt will increase the salt concentration by 500 ppm, see 'Salt: When And How To Add It'.

### **C. Free (residual) chlorine reading.**

The free chlorine residual in the pool should be a minimum of 1 ppm for unstabilised pools. For other pools follow the recommendations in the table below. Increasing the daily operating period of the system increases the free chlorine reading, and a shorter operating period reduces the chlorine reading.

Likewise, operating the chlorinator at maximum output will produce a higher chlorine reading than operating the chlorinator at say a 50% lower setting.

The following chart summarizes the recommendations for various pool water types for the free chlorine levels, as per Australian Standard AS3633 - 1989 for Private Swimming Pools Water Quality.

| Chlorine Use with Nature2 |               | As per Australian Standard AS 3633-1989 Private Swimming Pools |                      |                                      |                      |              |
|---------------------------|---------------|----------------------------------------------------------------|----------------------|--------------------------------------|----------------------|--------------|
| Water Quality             |               |                                                                |                      |                                      |                      |              |
| Acid                      |               | Unstabilised                                                   |                      | Stabilised                           |                      | Isocyanuric  |
|                           |               |                                                                |                      |                                      |                      |              |
| Pool Water                | Pool Type     | Free Chlorine                                                  | Total Chlorine       | Free Chlorine                        | Total Chlorine       | (Stabiliser) |
| Temperature               |               | * mg/litre                                                     | mg//litre            | mg/litre                             | mg/litre             | mg/litre     |
| Less than 26C             | Indoor Pools  | 1.5                                                            | Free Chlorine        | Indoor pools must not use stabiliser |                      |              |
|                           |               |                                                                | as Measured plus 1.0 |                                      |                      |              |
| Less than 26C             | Outdoor Pools | 1.0                                                            | Free Chlorine        | 2.0                                  | Free Chlorine        |              |
|                           |               |                                                                | as Measured plus 1.0 |                                      | as Measured plus 1.0 | 30-50        |
| More than 26C             | Indoor Pools  | 2.0                                                            | Free Chlorine        | Indoor pools must not use stabiliser |                      |              |
|                           |               |                                                                | as Measured plus 1.0 |                                      |                      |              |
| More than 26C             | Outdoor Pools | 2.0                                                            | Free Chlorine        | 3.0                                  | Free Chlorine        |              |
|                           |               |                                                                | as Measured          |                                      | as Measured          | 30-50        |

#### D. Chlorine stabiliser (Cyanuric acid) level.

Outdoor pool water should have a satisfactory chlorine stabiliser (Cyanuric acid) reading which is within the band of 30 - 50 ppm. (You need to take a water sample to your pool shop to measure this) Chlorine stabiliser will help maintain the free chlorine level in hot sunny weather or in hot climates.

#### E. pH readings

It is ABSOLUTELY ESSENTIAL that the pH of the pool be maintained in the range of 7.2 - 7.6 (for fibreglass pools, as low as 7.0). Regularly test or ask your pool shop to test the pH level. The effectiveness of chlorine as a sanitiser is significantly reduced as the pH rises. At a pH of 8.0, nearly all of the chlorine being added to the pool is wasted, and it will be almost impossible to maintain a satisfactory free chlorine reading.

#### F. Regular maintenance checks

##### WEEKLY:

- Check the free chlorine.
- Check the pH of the water. Adjust if necessary.
- Check the pressure gauge on the pool filter to see if backwashing is necessary.

##### MONTHLY:

- Check the salt concentration of the pool (see 'Salt:When And How To Add It below).
- Check the total alkalinity. Adjust if necessary.
- Check the chlorine stabiliser reading. Adjust if necessary.

##### PERIODICALLY:

- Check the electrode to remove any debris that may have passed through the filter and lodged in the Electrode. Take care not to scratch or bend the Electrode plates. (See 'Duoclear Maintenance' page 14).

### SALT: WHEN AND HOW TO ADD IT

Add salt when the "Add Salt" indicator light (4) comes on in the power pack control panel. The light marked 'Add Salt' (4) functions automatically when extra salt is needed. Note that the 'Add Salt' light (4) may switch on at any salt level between 3000 and 4000ppm, depending upon the water temperature and mains voltage (see note). This is not a fault but a precaution to ensure that the salt level is never too low. The salt concentration should normally be around 4000 ppm, but should never be allowed to fall below 3000ppm as this can reduce the cell life of the electrodes

## **SALT: WHEN AND HOW TO ADD IT**

Salt is not lost through evaporation. Salt is lost with the water splashed out of the pool or during backwash. Adding fresh water to the pool dilutes the salt concentration. A top-up of salt is needed from time to time, just before and just after summer are the best times.

**NOTE:** Even if the salt concentration is around 4000ppm, the “**Add Salt**” light (4) may switch on if the water temperature or mains supply voltage are too low. In this situation, it may not be possible to set the **Chlorine Output** (2) to maximum. The addition of more salt to the pool will allow the chlorine output to reach maximum settings.

## **How much to add**

Use only refined salt (sodium chloride) when adding salt to the water of your pool. For example home pools of about 50,000 litres need eight 25Kg bags of salt to reach 4000 ppm concentration for a new salt pool. Each additional 25Kg bag of salt will increase the salt reading by about 500 ppm. Larger pools require greater amounts of salt to be added. Add enough salt to obtain a salt concentration of 4000 ppm.

Note: ppm (parts per million) is sometimes referred to as mg/l (milligrams per litre).

You can work out how many 25kg bags of salt your size pool needs to start the salt chlorination system. Multiply the volume of water (litres) in your pool by 4 (4 grams per 1 litre) and divide by 25,000 grams (25kg) i.e. 60,000 litres x 4 grams = 240,000 ÷ 25,000 (1 x 25 kg bag) = 9.6 bags

## **How to add salt**

For regular maintenance, when the control panel indicates “**Add salt**” (4), empty the contents of no more than two 25Kg bags of salt at one time into the shallow end of the pool. The salt will slowly drift down to the deep end, helping to disperse the salt. Do not add the salt to the skimmer box. Run the filter for 4 to 6 hours to help disperse the salt around the pool.

Note: Allow 24 hours for the salt to fully dissolve.

Observe the DuoClear control panel and confirm the ‘**Add Salt**’ (4) light is not showing. If the light remains on, wait 24 hours and repeat the procedure with a further two bags of refined salt. The ‘Add Salt’ (4) light should now be off. If not (the light is still glowing) the Electrode should be checked to confirm it is functioning correctly. Please contact your Zodiac service technician or your pool shop to have the Electrode tested.

## **SOME TIPS ON WATER CHEMISTRY**

### **pH is very important.**

Do not confuse pH with total alkalinity. pH is a simple numerical scale which expresses the acid/alkaline balance of the water. A pH value of 7.0 denotes neutrality, i.e. neither acid nor alkaline. High pH values (i.e. above 7.0) denote alkaline conditions. Low pH values (below 7.0) denote acidic conditions.

### **How to adjust pH.**

Aim for a pH range of 7.2 - 7.8 which is ideal for maximum comfort and minimum chlorine demand. Always adjust total alkalinity (See below) before adjusting pH. Low pH (acidic water) leads to stinging eyes and corrosion of open metal fittings. Raise the pH by adding sodium bicarbonate, soda ash, or dry alkali. First pre-dissolve in water, then add no more than 500 grams at a time. Check the pH after each addition of the Sodium Bicarbonate thoroughly dispersed.

High pH (alkaline water) leads to clouding of the water and prevents the sterilising action of chlorine. This means algae and germs can grow. Lower the pH by adding hydrochloric acid to the pool water. The acid demand indicated by your 4-in-1 test kit will show the amount of acid to use (or check with your pool retailer). If it is difficult to maintain the correct pH levels check your total alkalinity.

### **Total alkalinity affects pH.**

Total alkalinity is a measure of the alkaline chemicals in your pool water (eg. Bicarbonates, carbonates and hydroxides). It can be thought of as the buffering system necessary to control pH. Low alkalinity can be compared to weak shock absorbers on a car - the pH will go up and down like a perpetual yoyo. pH will be difficult to adjust and staining of pool surfaces may occur when total alkalinity is too low.

Total alkalinity should be in the range of 80 - 150 ppm. Total alkalinity is often confused with pH, which it affects.

To raise total alkalinity, add pH buffer (also called pH stabiliser or sodium bicarbonate) at the rate shown in the manufacturer's instructions. A small amount is added daily to achieve a total alkalinity reading of 80 - 150 ppm.

To lower the total alkalinity, add 400 ml hydrochloric acid each day until a total alkalinity reading taken at least 24 hours later is in the range 80 - 150 ppm. When the total alkalinity is finally correct you may need to adjust the pH.

## PROBLEMS THAT YOU MAY ENCOUNTER

**NOTE:** If the chlorinator and pump are running you may see a cloud of small bubbles indicating hydrogen gas is being produced, which is normal.

### Problem A

Water looks clean but no chlorine residual reading.

To test for chlorine residual, switch on the filtration system and adjust the Zodiac DuoClear system to maximum output. After a few minutes take a water sample from the pool, test this water with your test kit. A minimum chlorine residual of 1 - 3 ppm is desirable.

#### REMEDY:

- Adjust the pH within the range 7.2 - 7.6.
- Make sure your cell is clean.
- Check cyanuric acid levels. (Stabiliser)
- Increase the setting of the output control.
- Check for phosphate.
- Adjust total alkalinity to recommended range.
- Increase the running time of the filter and chlorinator. Make sure that the filter is clean and functioning properly.
- Add salt if indicated by 'Add Salt' (4) light.

Use chlorine stabiliser (cyanuric acid) to protect chlorine residual. This chemical acts as a sun-screen for chlorine and prevents chlorine being destroyed too quickly by the sun. Chlorine stabiliser is essential to prolong the life of chlorine in the pool water.

It should be added following the stabiliser manufacturer's instructions to achieve a level of 30 - 50 ppm. This will be about 30 - 50g for every 1,000 litres of water. To avoid a "chlorine lock" in your pool make sure chlorine stabiliser levels do not exceed 50 ppm. (Stabilizer should not be used for indoor pools.)

### Problem B - Pool green and no chlorine reading

Chlorine is still considered the most effective way of destroying algae and bacteria in your pool water. A chlorine residual of 1 - 3 ppm is considered desirable. However, there are some types of harmful micro-organisms and algae which develop immunity to these low levels of chlorine and quickly use up the residual chlorine in the pool.

#### REMEDY:

Super Chlorinate or shock dosing, especially in hot weather, is the remedy. This procedure raises the chlorine residual to a very high level for a short period of time, and reduces chlorine demand.

##### 1. Super chlorinating with a Zodiac DuoClear system:

- i) Backwash the filter.
- ii) Adjust the pH to within the range 7.2 - 7.6.
- iii) Press the button marked 'Super Chlorinate' (3). The DuoClear system automatically increases its output and runs for approx. 24 hours uninterrupted. The internal timer controls the DuoClear and the complete filtration system during this period, returning to the original timer settings, when the **Super Chlorinate** function is complete.
- iv) After 24 hours, backwash the filter.
- v) Re-adjust the pH to 7.2 - 7.6.
- vi) Check the chlorine reading.

vii) If the chlorine reading is too low, repeat steps (iii) to (vi) until the chlorine reading is satisfactory.

## **2. Shock dosing with chlorine or oxidising agents:**

i) Backwash the filter.

ii) Adjust the pH to within the range 7.2 - 7.6.

iii) Add 100ml of liquid chlorine for every 1000 litres of pool water or at the rate recommended by the manufacturer or your pool shop. When shock dosing, it is most important to add all the chlorine in one dose. If in doubt, or if the problem is severe, use more rather than less, all in one dose.

iv) After shock dosing, re-adjust the pH to within the range of 7.2 - 7.6 and check the chlorine level before using the pool. Up to 5ppm is not harmful.

### **High Phosphate Water Content**

Pools with high phosphate levels will feed algae and go green, especially in rural or open areas, around lawns or when numbers of trees attract bird life. The main food for algae is phosphate and a high level in the water can prevent even high levels of chlorine from killing the algae. Ask your pool retailer to test for phosphate and use phosphate remover to remedy the problem.

## **Problem C - Chlorine odour**

**Cause:** *Not enough free chlorine.*

Surprisingly, the problem here is not too much chlorine as many imagine. Chloramines form by the bonding of chlorine with amines from sweat, urine and other sources. These chloramines make the chlorine odour and can also cause eye and skin irritation. Free chlorine does not smell (up to 10 ppm concentration).

### **REMEDY:**

Same as problem B

## **Problem D - Slimy walls of pool or spa**

**Cause:** *Combined algae and bacteria growth.*

### **REMEDY:**

Scrub down the affected walls and follow remedy as for Problem B, using a large shock dose of chlorine or treat with a phosphate remover.

## **Problem E - Eye and/or skin irritation**

**Cause:** *Incorrect pH levels.*

### **REMEDY:**

Adjust the pH to within the range 7.2 - 7.6. If the problem continues, follow the remedy in Problem B.

## **Problem F - Scale or calcium build-up on Electrodes**

To clean the deposit (scale) from the Electrode

**Cause 1:** *Incorrect pH and hard water.*

### **REMEDY:**

Adjust the pH to within the range 7.2 - 7.6.

**Cause 2:** *Total hardness.*

### **REMEDY:**

Adjust the total hardness to below 400 ppm.

## **Problem G - Chlorine output will not reach maximum - Add Salt (4) light may also be on.**

**Cause 1:** *Salt level below 4000ppm or water very cold.*

### **REMEDY:**

Add Salt (4) (See Salt:When and How to Add it page 18)

**Cause 2:** *Electrode reversing (self clean).*

### **REMEDY:**

If the Electrode is reversing the yellow light on the Chlorine Output indicator will flash, wait around three minutes and the output should return to normal.

**Cause 3:** *Electrodes may be damaged.*

**REMEDY:**

Replace Electrode. The Electrodes must be replaced with the same model or the DuoClear system will not function correctly, see Zodiac or a Zodiac Service Centre.

## **Problem H - No Flow (5) light on**

**Cause 1:** *Insufficient water flow through the DuoClear housing.*

**REMEDY:**

Ensure sufficient water flow through the DuoClear vessel. Is the filter-pump on? Is the flow restricted because the filter needs backwashing? A pocket of air may be trapped in the top of the electrode.

**Cause 2:** Sensor disconnected.

**REMEDY:**

Make sure that the Electrode lead from the power pack to the Electrode is firmly plugged into the Electrode terminals.

## **Problem I - DuoClear system stops working, all lights OFF**

**Cause 1:** Unit turned off.

**REMEDY:**

Reconnect plug or push ON/OFF button and check ON/OFF indicator on timeswitch.

**Cause 2:** Mains power removed, plug disconnected or circuit breaker off.

**REMEDY:**

Reconnect plug or check mains power source, check circuit breaker is on.

## **Resetting the Circuit Breaker**

Switch off and disconnect the DuoClear system from the mains power. An on-board mains circuit breaker is located in the bottom rear of the DuoClear control panel next to the power cord. Check and if necessary reset circuit breaker. Reconnect the DuoClear system to mains power and switch on. If the circuit breaker continues to switch off this indicates a serious fault, switch off the power, disconnect the DuoClear system and contact Zodiac or a Zodiac service centre for further advice.

## **Mains power supply**

Your Zodiac DuoClear system must be connected to a properly earthed (grounded) electrical power socket, or power source.

## **CAUTION**

**Failure to observe the following could invalidate your warranty and damage pool equipment.**

1. The Zodiac DuoClear system must be installed and operated as specified.
2. Your DuoClear system has been fitted with an electronic flow switch (sensor). This device automatically switches the power 'OFF' when the water through the DuoClear housing stops. Do not in any way interfere with this system which has been fitted for your protection.
3. Do not scratch or bend the electrode in the housing.
4. Power to the DuoClear system should be turned off before unplugging the Electrode connectors.
5. Keep the Electrode terminals protected with a light smear of silicone grease. Use of other than silicone grease may damage the terminal seals and 'O' rings. Do not immerse these terminals in acid wash solution, and avoid accidental contact with salt water.
6. Water above the temperature of 40 degrees Celsius must not flow through the DuoClear vessel.
7. Water pressure in the DuoClear vessel housing must not exceed 200kPa
8. Check the electrode housing frequently to prevent the accumulation of pool debris that for any reason may have by-passed the pool filter.
9. Control panel must not be installed directly above any other heat source such as filter pump or heater. It must be at least 1.5 meters from the ground to allow free circulation of air around it. It must not be enclosed in a closed box. If the control panel is to be installed on a post then it must be centrally positioned on a flat panel of suitable waterproof material at least 350mm wide and 310mm 440mm high. As for all electronic equipment the control panel life will be increased if it is mounted in a shady spot and not in direct sunlight.
10. Never plug more than one pump at a time into the 3-pin socket (where fitted) in the base of the power supply.

## **Duoclear Warranty**

Remember to register your warranty within fourteen (14) days from date of purchase/installation.

## **Vessel Warranty**

The Duoclear Vessel was manufactured with care and is warranted to be free of defects in materials and workmanship from the date it was installed for 3 years. Your DuoClear warranty registration card must be completed and mailed to Zodiac Group Australia Pty Ltd to establish your installation date. This warranty does not cover damage caused by abuse, misuse, accidents or any alterations to the Purifier. Report claims to your Authorised Duoclear Dealer. Zodiac Group Australia Pty Ltd reserves the right to replace any purifier instead of repairing it.

## **Non-Staining Warranty**

Your Nature2 Purifier cartridge is warranted not to cause copper staining in your pool. This warranty requires only that you exercise reasonable care of your pool and keep water in balance at all times, and not use copper-based algicide. The DuoClear Owners Manual will guide you as to how to maintain your pool properly when using the DuoClear system. This warranty does not cover discolouration to chromium fittings which may discolour slightly over time and are easily cleaned with a mild detergent. There are no other warranties, expressed or implied (apart from those concerning the control panel or electrode on page 28). Proof of purchase is required to make any claims on the above warranties, so please keep your dated receipt.

This warranty is not valid outside of Australia and New Zealand.

For more information talk to your local pool shop or telephone Zodiac Group Australia: 1800 688 552 or access our webpage: [www.zodiac.com.au](http://www.zodiac.com.au)

Due to constant developments and improvements, specifications may change without notice. Your Zodiac DuoClear System has been manufactured with the greatest of care and from the best available materials. The warranty period begins on the date of the manufacture according to the serial number on the product, unless proof of purchase date is supplied, or the warranty has been registered with us. Refer also to the section titled "Caution" in the Owner's Manual. This warranty will be void if parts other than Zodiac approved parts are used for repairs.

## **DuoClear (excluding cell electrodes) Warranty**

The manufacturer warrants for a period of 2 years from the date of purchase, defects found to be due solely to faulty materials or workmanship. It will repair or replace at its option such faulty materials or parts free of charge.

## **Electrode Warranty**

Two electrode warranty options are available to pool owners as follows;

**1. Special Lifetime Electrode Warranty** - Zodiac warrant that it will replace the electrodes free, when they need replacing, for the lifetime of the DuoClear system, providing that the Nature2 cartridge is replaced regularly every 6 months.

Proof of cartridge purchases must be retained or may be recorded by sending a copy of the purchase details to Zodiac for computer entry on your warranty card details.

**2. Standard Electrode Warranty** - The electrodes and their special coatings are covered by a 1-year full warranty. In addition to the 1-year full warranty, the manufacturer warrants the products for a subsequent 2-year period, pro-rated over the three years.

The cost of field service calls, or of freight back for repairs are not covered by the warranty. The Zodiac warranty is transferable and protects the original purchaser and subsequent owners of the product. Proof of purchase or registration of the warranty with Zodiac Group Australia Pty Ltd must be provided by the owner to support any warranty claim.

This pro-rata warranty is offered by Zodiac directly to the Duoclear end-user and requires that person to deal directly with Zodiac Group Australia Pty Ltd.

**\*The warranty applicable to commercial application is limited to 12 months from the date of installation.**

**Don't forget to complete your purchase details on the inside back cover of this warranty and return the Reply Paid Warranty Registration to Zodiac Group Australia Pty Ltd.**